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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,495	09/26/2003	Lawrence W. Golick	2	3528
7590 06/03/2005			EXAMINER	
Ryan, Mason & Lewis, LLP 90 Forest Avenue Locust Valley, NY 11560			PAREKH, NITIN	
			ART UNIT	PAPER NUMBER
			2811	
DATE MAILED: 06/03/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/672,495

Applicant(s)

GOLICK, LAWRENCE W.

Examiner

Nitin Parekh

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-20 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

A. The limitations as recited in claim 2, line 1, include: "wherein the at least one additional lead is wire bonded to the die within the package body".

Therefore, the additional lead as being wire bonded must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-7, 9, 10, 15, 16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al (5414299).

Regarding claims 1 and 15, Wang et al. disclose packaged integrated circuit (PIC) comprising:

- a die/IC (150 in Fig. 10A-11)
- a package body (301 in Fig. 10A-11; Col. 8, line 64) formed from an encapsulant partially enclosing the die
- a tape automated/bonded leadframe (TABLF) connected to the die and partially enclosed within the package body and having leads extending from the package body (see 102, 202, etc. in Fig. 10A-11)

- a subset of the leads of the TABLF being separated by a lead-to-lead pitch (202 in Fig. 11), wherein two adjacent leads of the TABLF are separated by a space larger than the pitch (see configuration of 102 in Fig. 11), and
- an additional lead (202 in Fig. 11) connected to the die and disposed on an underside of the package body, the at least one additional lead being connectable to a printed circuit board (PCB)/circuit mounting structure trace passing between the adjacent leads separated by the space larger than the pitch (see the lead 102 being connected to respective bonding site/trace 192 in Fig. 8; Col. 8, lines 13-36)
(Fig. 10A-11; Col. 8, line 63- Col. 9, line 68; Fig. 3A-11; Col. 4-10).

Regarding claim 3-7, Wang et al. disclose the entire claimed structure as applied to claim 1 above, wherein Wang et al. further teach:

- the additional lead being coplanar/substantially flush with the underside of the package body (Col. 9, lines 26-28; see Fig. 8 and 11), and
- the additional lead being disposed adjacent to the die on the underside of the package body, on each side of the die and being closest to the space larger than the pitch (202 in Fig. 11)
- the space larger than the pitch being disposed between two adjacent leads on each side of the package body (see Fig. 11).

Regarding claims 9 and 10, Wang et al. disclose the entire claimed structure as applied to claim 1 above, wherein Wang et al. further teach a die pad (see 300b in Fig. 10B) of the die being exposed on the underside of the PIC and the leads/PIC being configured for carrying conventional ground/power, data/control-signal functions (Col. 3 and 10).

Regarding claim 16, Wang et al. disclose the entire claimed structure as applied to claim 1 above.

Regarding claim 20, Wang et al. disclose the entire claimed structure as applied to claim 1 above, wherein Wang et al. further teach the PIC having the additional lead being electrically connected to the desired ground/power or signal connections and to the PCB/circuit mounting structure having a plurality of bonding sites/traces (see Fig. 8). The PCB/circuit mounting structure further comprising an electrical connector/reference plane providing the desired ground/power or signal connections (see 520 in Fig. 8; Col. 8, lines 28-38).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Wang et al (5414299) in view of admitted prior art (APA).

Regarding claim 8, Wang et al. disclose substantially the entire claimed structure as applied to claim 1 above, except the PIC being configured as a Thin Quad Flat Package (TQFP).

The APA teaches the PICs having conventional configurations as TQFP (see specification pp. 1 and 2).

It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the PIC being configured as the TQFP as taught by the APA so that the desired package dimensions can be achieved in Wang et al's PIC.

6. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Wang et al (5414299) in view of Nelson et al. (US Pat. 5376909).

Regarding claims 11-14, Wang et al. disclose substantially the entire claimed structure as applied to claim 1 above, except:

- a) the additional the additional lead being configured for carrying a signal having a frequency of at least 2 GHz, or
- b) lead-to-lead pitch being approximately 0.4 mm, each lead being approximately 0.2 mm wide or the space larger than the pitch being determined by the equation, $LP = wx + p(x+1)$, wherein LP represents the space larger than pitch, w represents a width of the leadframe leads, p represents the lead-to-lead pitch, and x represents the number of leadframe leads removed to form the space larger than pitch.

Nelson et al. teach a high frequency PIC having the leads being configured for operating up to a frequency of about 6 GHz and the leads/conductors having dimensions width/thickness/spacing/gap ranging from 10 mils –200 mils (see Col. 6, lines 21- Col. 8, line 28; Tables 1 and 2; Fig. 1-9). Furthermore, determination of parameters such as lead dimensions including thickness, spacing/pitch/gap, number of leads, etc., bonding wire length, etc. in leadframe packaging art is a subject of routine experimentation and optimization to achieve the desired electrical performance and reliability.

It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the elements a) or b) as taught by Nelson et al. so that the desired electrical performance, grounding and noise reduction can be achieved in Wang et al's PIC.

7. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Wang et al (5414299) in view of Lamson et al. (US Pat. 5233220).

Regarding claims 17-19, Wang et al. disclose substantially the entire claimed structure as applied to claim 1 above, except at least one locking mechanism coupled between the adjacent leads having the space larger than the pitch there between, the locking mechanism being configured to maintain the space larger than the pitch.

Lamson et al. teach a PIC having a locking mechanism coupled between the adjacent leads having the space larger than the pitch there between (see 24a/24b/24c in Fig. 1; Col. 5, lines 19-32), the locking mechanism being V/Y shaped having a central portion arranged within the IPC/package body and first and second legs each extending toward a perimeter of the IPC/package body. Furthermore, the determination of shape/size of the leads is considered to be well within one of ordinary skill in the art.

It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate at least one locking mechanism coupled between the adjacent leads having the space larger than the pitch there between, the locking mechanism being configured to maintain the space larger than the pitch and the locking mechanism being U shaped having a central portion arranged within the package body and first and second legs each extending toward a perimeter of the package body as

taught by Lamson so that the desired lead-to-lead spacing can be achieved and leadframe processing can be simplified in Wang et al's PIC.

Allowable Subject Matter

8. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

9. The following is an examiner's statement of reasons for allowance:

The references of record do not teach either singularly or in combination at least the limitations "a subset of the leads of the leadframe being uniformly separated by a lead-to-lead pitch, wherein at least two adjacent leads of the leadframe are separated by a space larger than the pitch; and at least one additional lead connected to the die and disposed on an underside of the package body, the at least one additional lead is connected to a circuit mounting structure trace passing between the adjacent leads separated by the space larger than the pitch" and "at least one additional lead is wire bonded to the die" in an encapsulated leadframe package.

Response to Arguments

10. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is 571-272-1663. The examiner can normally be reached on 09:00AM-05:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAN or Public PAG. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAG system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NP

06-01-05



NITIN PAREKH

PRIMARY EXAMINER

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